American Insects. "American Nature Series." By VERNON L. KELLOGG. New York: Henry Holt, 1908. Pp. xiv+693. 812 figures. $5.00.

A second edition of *American Insects* by Professor Kellogg contains an extensive collection of data interesting to any general student of insect life. An introductory discussion presents fully and in a most readable manner the general facts concerning the structures and functions of parts of insects, and the metamorphoses found in their life-cycles. Following a discussion of the plan of classification of insects, the groups of insects, under fourteen order-headings are discussed. In presenting each order, in addition to discussion of the characteristic structure of its members, and the general facts of their metamorphoses, the natural-history or ecological aspects receive so full treatment as to make the book a valuable source of information.

In a chapter on "Insects and Flowers" the author demonstrates, that while he may be entirely accurate as an entomologist, the botanical side of the discussion is not so dependable. Of this three illustrations may be cited. First, in presenting the general plan of fertilization in seed plants, a figure (Fig. 761, 2.) is presented from which one would infer that fertilization takes place within the pollen-tube after it has extended into the embryo-sac. The figure is copied from a fairly well-known textbook of botany. Secondly, it is stated that "Cross-pollination is simply the bringing of pollen from one plant individual to the stigmas of another individual of the same species." Amongst botanists cross-pollination is understood to cover all cases of transfer of pollen from one *flower to another* whether these flowers are grown upon the same individual plant or separate individuals. The content of the term is much wider than indicated in the above quotation. Thirdly, there appears a wholly inexcusable error, one that illustrates the great danger of not knowing one's data by means of a study of the materials discussed, or at least of authentic accounts regarding these materials. The oft-cited case of self-pollination of *Yucca* by means of the moth *Pronuba* is described as a remarkable case of *cross-pollination,* it being stated that the account is "taken largely from Steven's *Introduction to Botany.*" After describing the preliminary behavior of *Pronuba* it is stated that, "Having become well loaded with pollen, as shown in the photo-micrograph of the moth's head, it descends the stamen and flies to another flower. There it places itself on the pistil between two of the stamens and thrusts a slender ovipositor through the wall of the ovary and into the cavity occupied by the ovules. Having deposited an egg, it ascends the pistil . . . . it rubs pollen down the inner surface of the stigmatic tube." This process is reported then to be repeated within the same flower without the moth having secured a new supply of pollen. Unfortunately for these authors, those who have observed and described this wonderful case of *Yucca* and *Pronuba,* point out that the entire process, pollen-gathering and all, occurs within the same flower, hence *self-* and not *cross*-pollination is secured.

Timely attention is given to the following topics, a chapter being given to each: "Color and Pattern and Their Uses," "Insects and Disease," "Reflexes, Instincts, and Intelligence," and "Collecting and Rearing Insects."

O. W. CALDWELL

THE UNIVERSITY OF CHICAGO